

1. An article as a computer-readable medium storing data structures of both executable and operational types, the data structures comprising:

an input module configured to receive inputs corresponding to design elements, characterized by properties stored in records, the design elements being connectable to establish an HVAC system to be designed;

a design module operably connected to the input module and configured to operate on the inputs to create the records reflecting the properties of the design elements and interactions thereof to establish a design of the HVAC system;

the input module and design module, further configured to automatically provide multiple schematic representations of a selected design element, selected from the design elements, the multiple schematic representations reflecting distinct operational contexts of the selected design element, and to automatically maintain substantially complete and consistent information in the records, describing the properties of the selected design element in each of the distinct operational contexts; and

an output module configured to provide a user-interpretable output reflecting the design of the HVAC system.

2. The article of claim 1, wherein the data structures further comprise a user interface module configured to receive inputs from a user to control selection, relative positioning, and properties of design elements of the HVAC system to be designed and configured to output to a user a graphical representation of the HVAC system reflecting the selection, relative positioning, and properties of the design elements.

3. The article of claim 2, wherein the input module and user interface module are configured to interface with the design module substantially independently from one another.

4. The article of claim 1, wherein the input module further comprises a user interface module configured to:

receive inputs from a user to control selection, relative positioning, and properties of design elements of the HVAC system to be designed, and

output to a user a graphical representation of the HVAC system reflecting the selection, relative positioning, and properties of the design elements.

5. The article of claim 1, wherein the operational contexts are selected from mass transport and energy transport.

6. The article of claim 5, wherein mass transport includes at least one of air transport and water transport, and wherein energy transport includes at least one of heating and cooling with respect to the selected design element.

7. The article of claim 1, wherein:

the selected design element comprises a product available from a vendor, independent from the article, the product characterized by product properties corresponding thereto; and

the design module further comprises a specification module, executable to assign the product properties as the properties of the selected design element.

8. The article of claim 7, wherein the data structures further comprise a product module configured to manage data reflecting the product properties.

9. The article of claim 8, wherein the product module further comprises an updating module configured to update the product properties

10. The article of claim 7, wherein the data structures further comprise a communication module configured to automatically establish communication between a user and the vendor of the product.

11. The article of claim 10, wherein the communication module is further configured to do at least one of making inquiries of the vendor, placing orders with the vendor, and downloading updated values of the product properties from the vendor.

12. The article of claim 1, further configured to interact with a third party module provided by a third party

product module holds all data and interfaces with vendor software

13. The article of claim 1, wherein the data structures further comprise a load module configured to provide, to the input module, HVAC loading parameters required to be accommodated by the HVAC system design.

14. The article of claim 13, wherein the data structures further comprise a CAD module configured to provide, to the input module, data reflecting a design of an edifice to be serviced by the design of the HVAC system.

15. The article of claim 14, wherein the data structures further comprise a product module configured to specify products available for sale and meeting requirements to be the design elements.

16. The article of claim 15, wherein the data structures further comprise a compensation module configured to identify monetary compensation due to a user from vendors of the products specified as design elements in the HVAC system design.

17. The article of claim 1, wherein the input module is further configured to interact with:

a CAD module provided by an independent third party to provide, to the input module, data reflecting a design of an edifice to be serviced by the design of the HVAC system;

a load module configured to receive outputs from the CAD module and provide, to the input module, HVAC loading parameters required to be met by the HVAC system design; and

a vendor module, provided by an independent vendor and configured to specify products available for sale and meeting the requirements to be the design elements.

18. The article of claim 1, wherein the output module is further configured to do at least one of generating reports, drawing schematic illustrations, providing schedules of components, and providing performance analyses reflecting the design elements.

19. The article of claim 1, wherein the product module further comprises a specification module configured to provide a detailed specification for an arbitrary number of selected design elements.

20. The article of claim 19 wherein:

the product module further comprises product data corresponding to products available from vendors to serve as the design elements, and

the specification module further comprises a filter module configured to sort the products by features thereof and priorities of the features, each selectable by a user, in order to automatically specify detailed parameters characterizing a product selected by a user to serve as the selected design element.

21. The article of claim 20, wherein the user interface further comprises a selection module providing a palette of icons representing design elements selectable arbitrarily by a user and connectable to one another in a schematic work space to establish the HVAC system design.

22. A method for designing an HVAC system, the method comprising:

providing a database having records and configured to manage values of properties corresponding to design elements corresponding to substantially all physical components and connections available for creating an HVAC system design;

providing a user interface configured to represent design elements arbitrarily selectable by a user and connectable to one another in a schematic to establish the HVAC system design;

providing, automatically, default values corresponding to the properties corresponding to the design elements;

selecting arbitrarily, from the design elements, by a user, an arbitrary number of selected design elements to be interconnected in the HVAC system design;

selecting, by a user, a relative location and interconnections corresponding to each arbitrary design element;

calculating, automatically, values of properties characterizing the arbitrary design elements;

validating correctness of the interconnections and properties;

calculating performance parameters corresponding to the HVAC system design; and

providing drawings defining the HVAC system design for construction.

23. The method of claim 22, further comprising creating and outputting schedules specifying each of the arbitrarily selected design elements.

24. The method of claim 23, further comprising providing a list of products and corresponding vendors meeting the performance parameters corresponding to the selected design elements.

25. The method of claim 24, further comprising automatically downloading from a vendor updated lists of products and corresponding properties.

26. The method of claim 22, further comprising obtaining, from a loads program, selected performance parameter requirements corresponding to the design elements.

27. The method of claim 26, further comprising:
providing an input module configured to support user selection of design elements;
and
interacting the input module with the loads program to provide selected inputs automatically to the input module.

28. The method of claim 27, further comprising:
providing a CAD program to provide inputs, corresponding to a structure to be served by the HVAC design, into the loads program.

29. The method of claim 22 further comprising providing a compensation module configured to automatically provide notification of compensation due to a user as a result of incorporating a product of a vendor into the HVAC design as one of the design elements.

30. The method of claim 22, wherein the properties are selected from intrinsic parameters inherent in the design elements and extrinsic parameters corresponding to external environmental conditions corresponding to the design elements.